

Multi-state EHR-based Network for Disease Surveillance (MENDS)

CSTE Chronic Disease and Oral Health Workshop
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Welcome



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Agenda

- **Background**
- **Approach**
- **MENDS National Model**
- **Partner Site Spotlight: Washington**
- **Questions**

Background



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CHRONIC DISEASE DIRECTORS
Promoting Health. Preventing Disease.

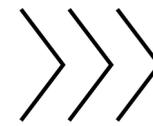
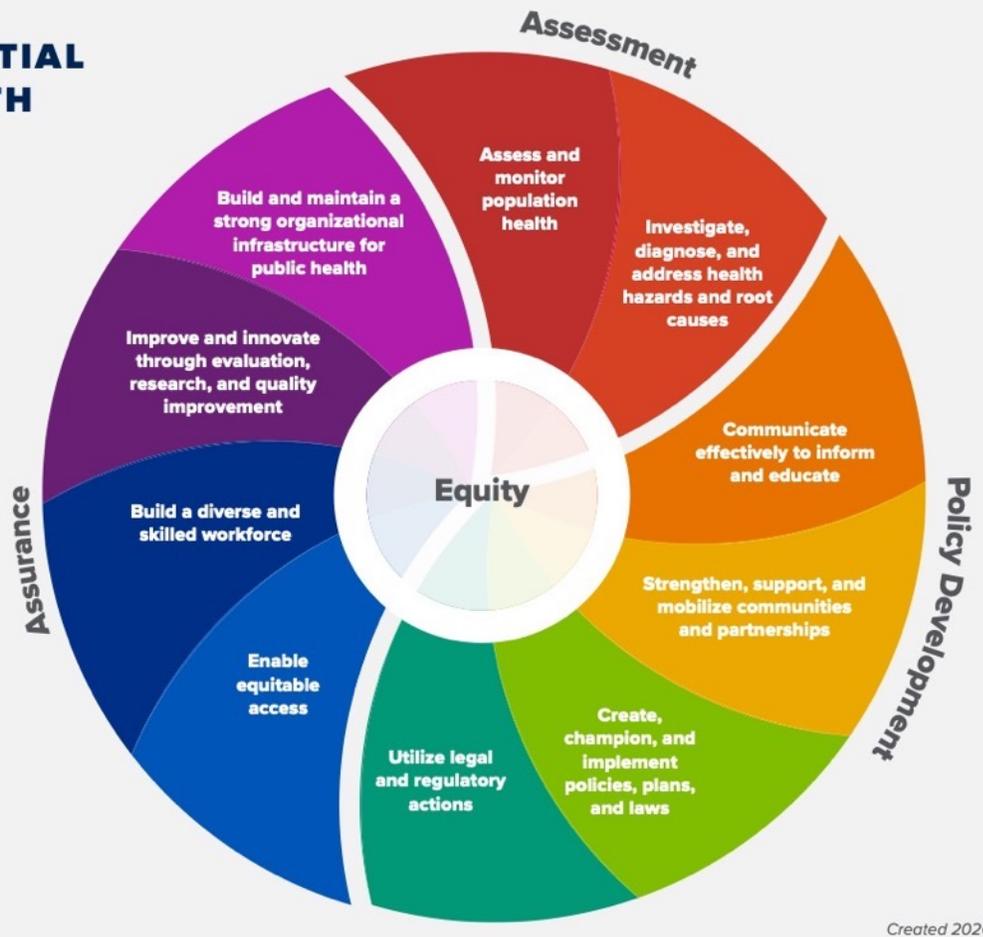


Background

THE 10 ESSENTIAL PUBLIC HEALTH SERVICES

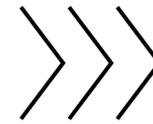
To protect and promote the health of all people in all communities

The 10 Essential Public Health Services provide a framework for public health to protect and promote the health of all people in all communities. To achieve optimal health for all, the Essential Public Health Services actively promote policies, systems, and services that enable good health and seek to remove obstacles and systemic and structural barriers, such as poverty, racism, gender discrimination, and other forms of oppression, that have resulted in health inequities. Everyone should have a fair and just opportunity to achieve good health and well-being.



Behavioral Risk Factor Surveillance System (BRFSS)

- Limited in scope
- Self-reported
- Not timely
- Declining response rates
- Reductions in funding



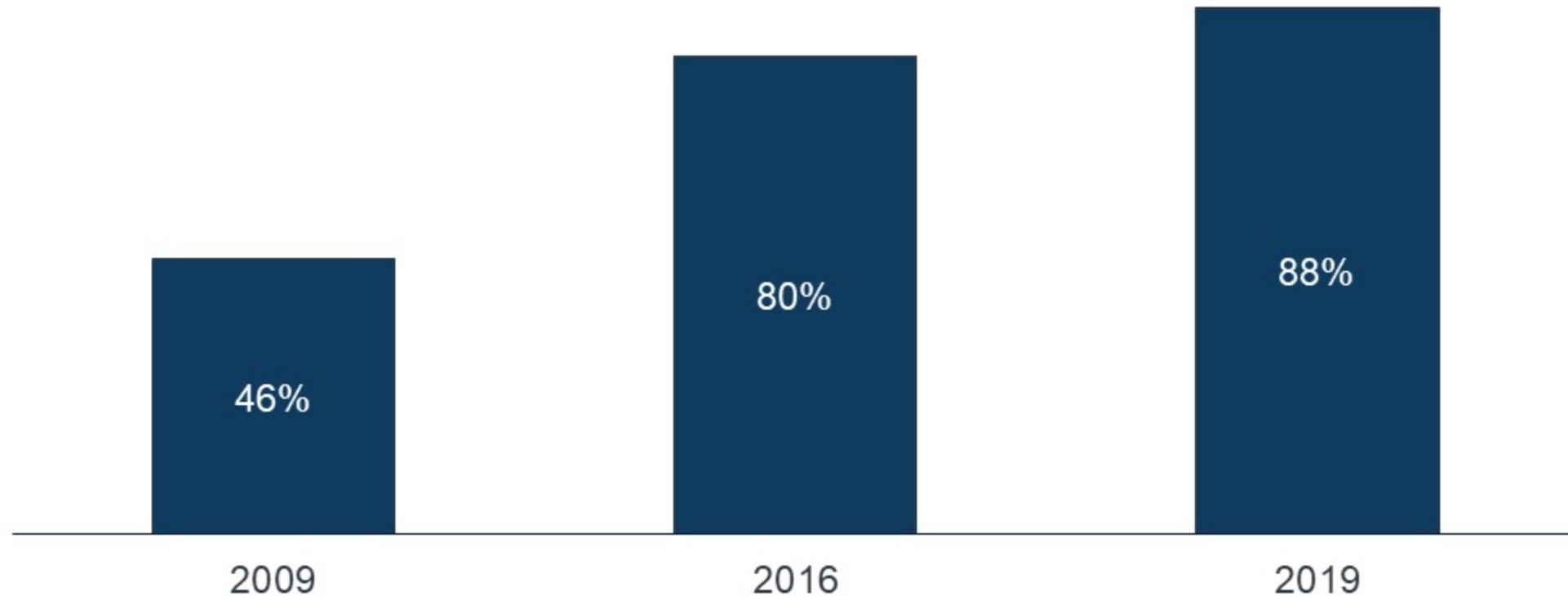
Large Administrative Datasets Managed by Public Health

- Limited in scope
- Not timely
- Challenges in establishing DUAs
- Difficulty funding PH IT infrastructure

Figure 1

Majority Of The Public Now Says Their Physician Uses A Computer-Based Medical Record

Percent who say their doctor or other health provider usually enters their health information into a computer-based medical record:



SOURCE: KFF Health Tracking Polls. See topline for full question wording and response options.

Published: Mar 18, 2019

Background

“Is there an opportunity for public health to use data for chronic disease surveillance that it does not own?”

Limitations of existing surveillance

Rise in health IT

CDC’s push towards data modernization

Predecessor models: Macroscope, MDPHnet, CHORDS

“Yes”

Approach



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Selecting a model for EHR-based surveillance

A model that embraced the following six principles:

1. Takes advantage of the breadth of clinical data available in EHRs (demographics, vital signs, laboratory tests, prescriptions, and diagnoses)
2. Surveillance algorithms must be transparent and clinically meaningful
3. Compatible with an array of electronic health record systems rather than tied to one proprietary platform
4. Allow data owners to retain as much control and oversight of their data since this facilitates participation
5. Should ideally be open source
6. Should be compatible with emerging data exchange standards such as FHIR

-> **Massachusetts Department of Public Health's MDPHnet system**

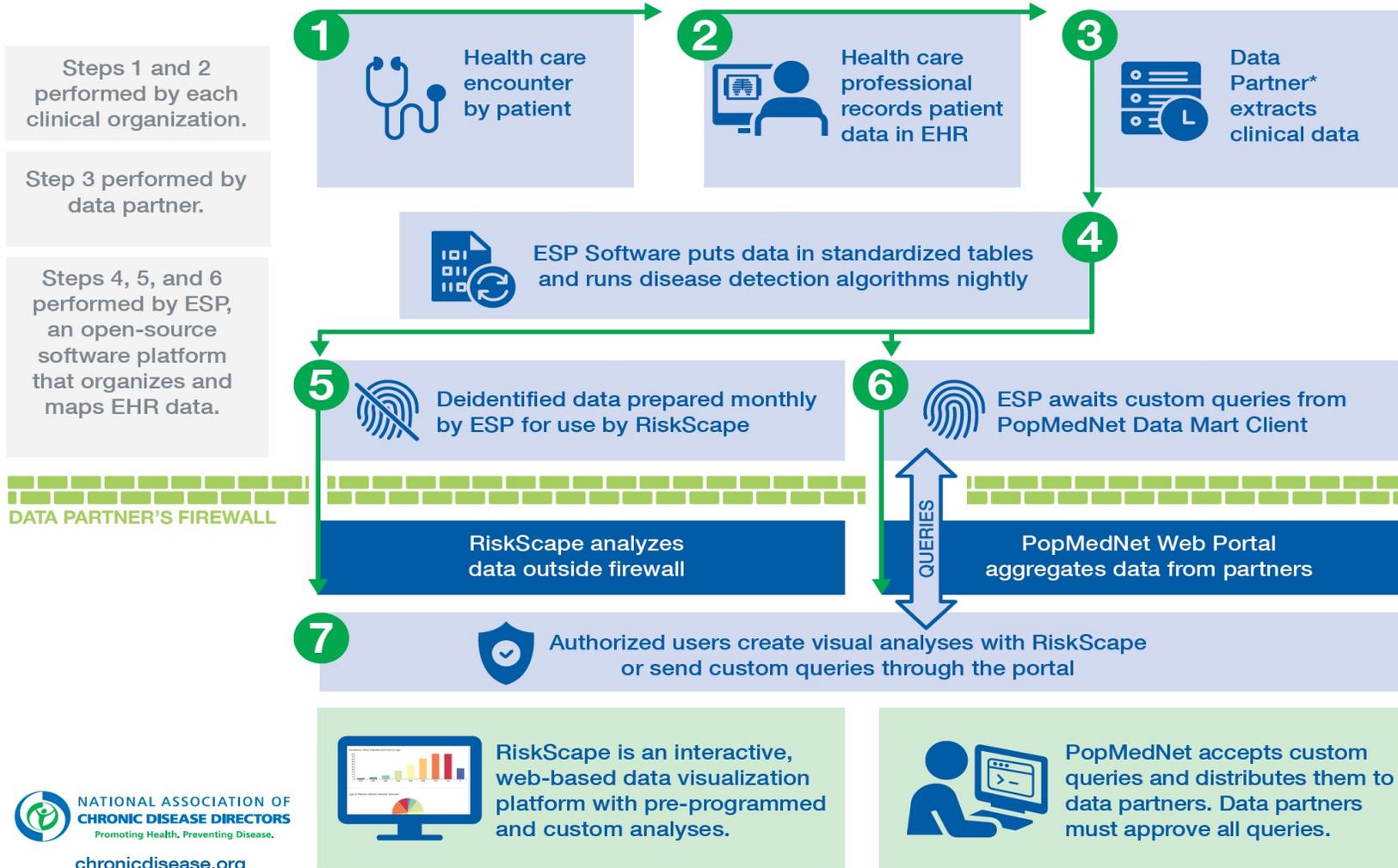
-> MDPHnet platforms: ESPnet, PopMedNet, RiskScape



Infographic

Multi-state EHR-based Network for Disease Surveillance

How MENDS Works



Addressing limitations

EHR data may not be representative of the general population

- In MENDS, selection of partner sites was non-random, and populations covered by partner sites do not reflect the total populations living in areas served by partners.
- MENDS will apply statistical procedures to:
 - Generate weighted prevalence estimates that accurately reflect the underlying populations at target geographic levels
 - Produce model-based estimates for small geographic regions and populations that are underrepresented in MENDS EHR data

MENDS National Model



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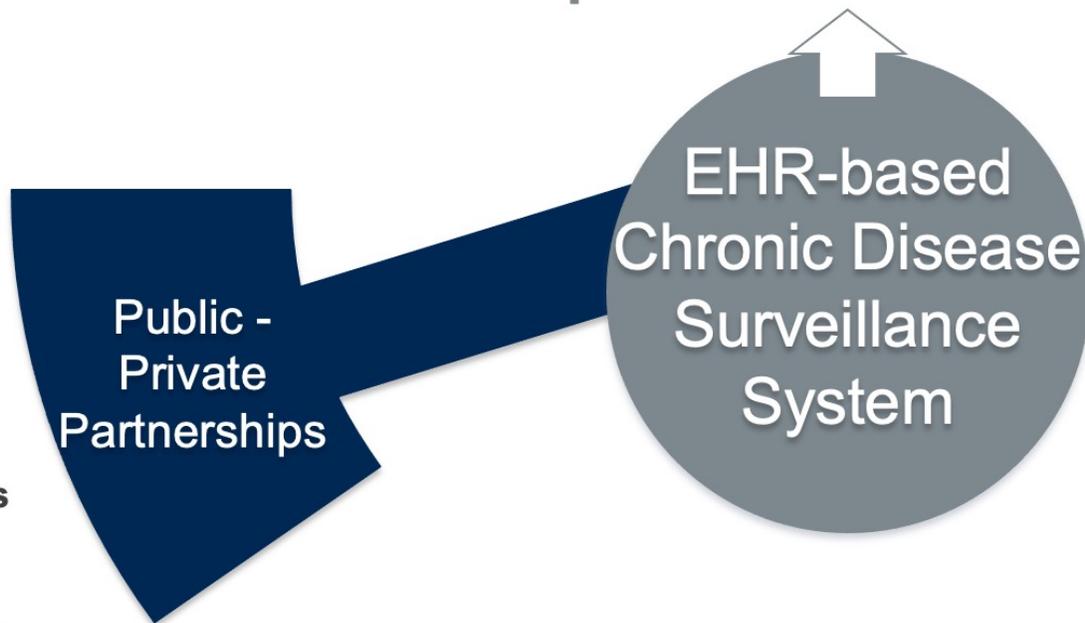
Key components

**Timely and reliable national and sub-national chronic disease estimates
for public health surveillance**



Key components

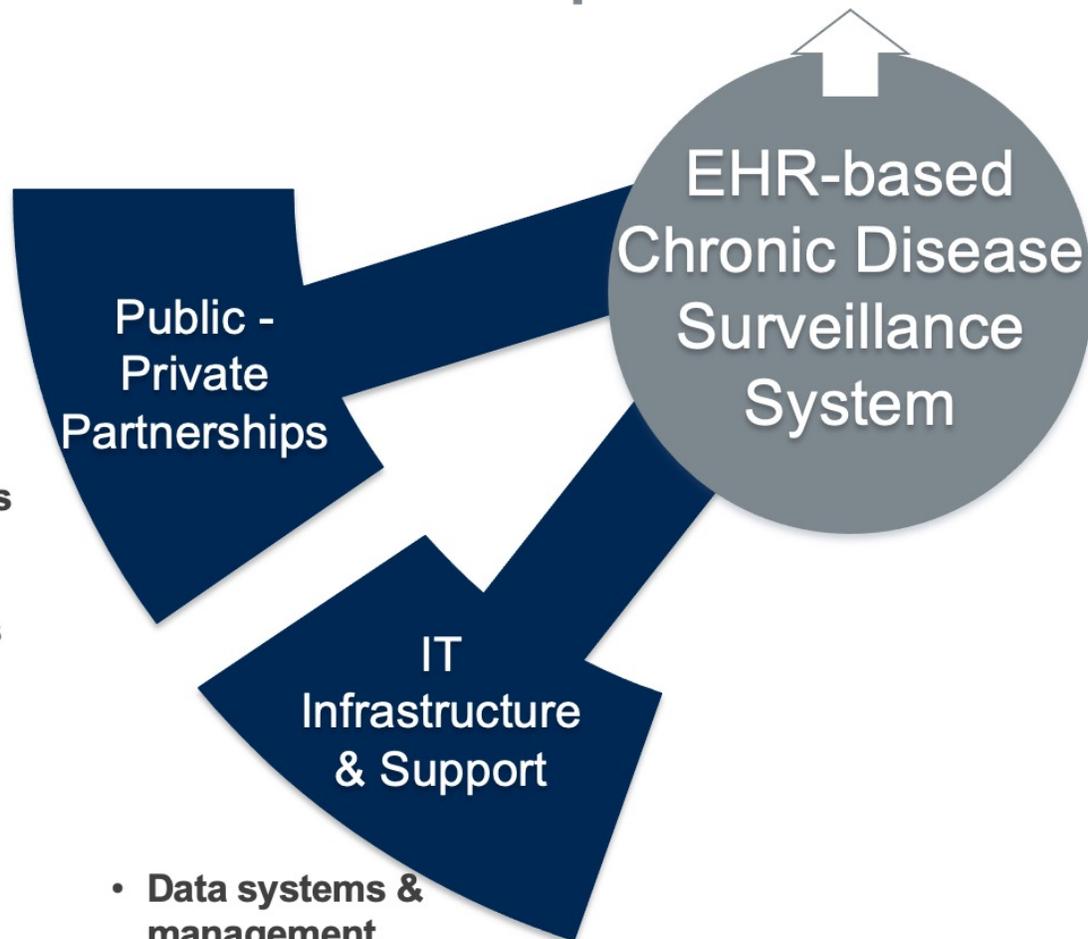
Timely and reliable national and sub-national chronic disease estimates
for public health surveillance



- **MENDS national team**
- **Data contributors**
- **Data users**
- **Partnership agreement terms**

Key components

Timely and reliable national and sub-national chronic disease estimates
for public health surveillance

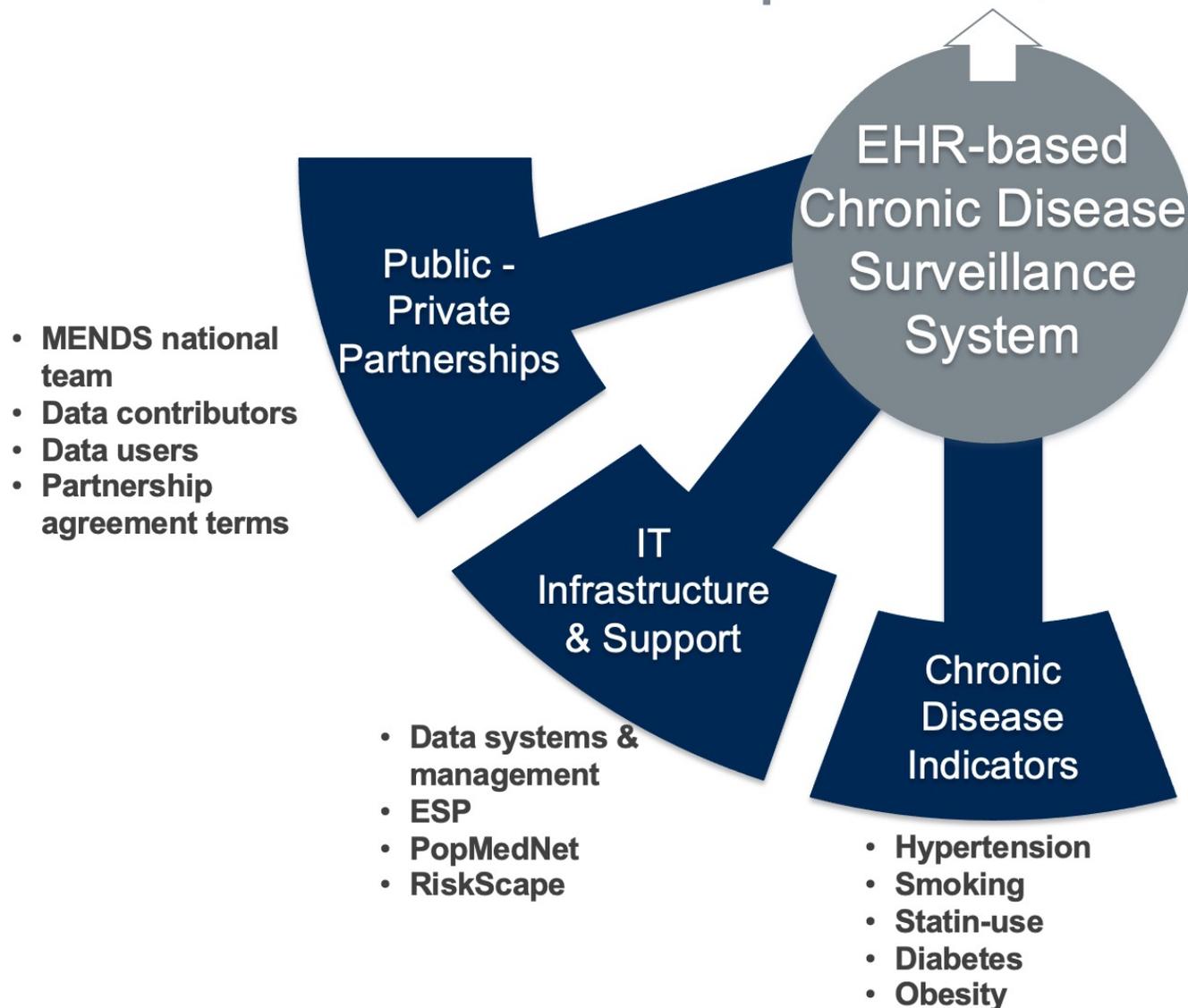


- **MENDS national team**
- **Data contributors**
- **Data users**
- **Partnership agreement terms**

- **Data systems & management**
- **ESP**
- **PopMedNet**
- **RiskScape**

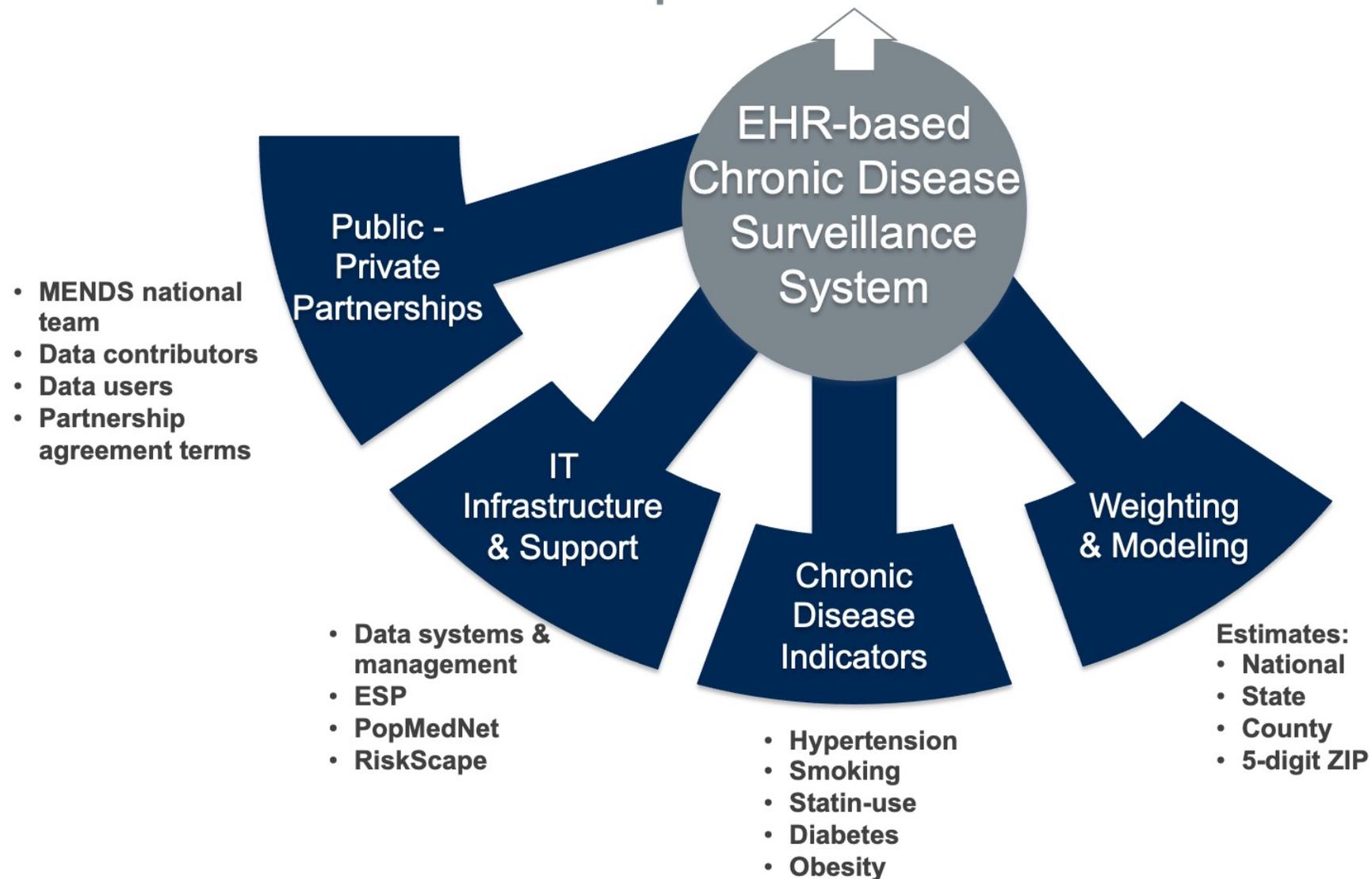
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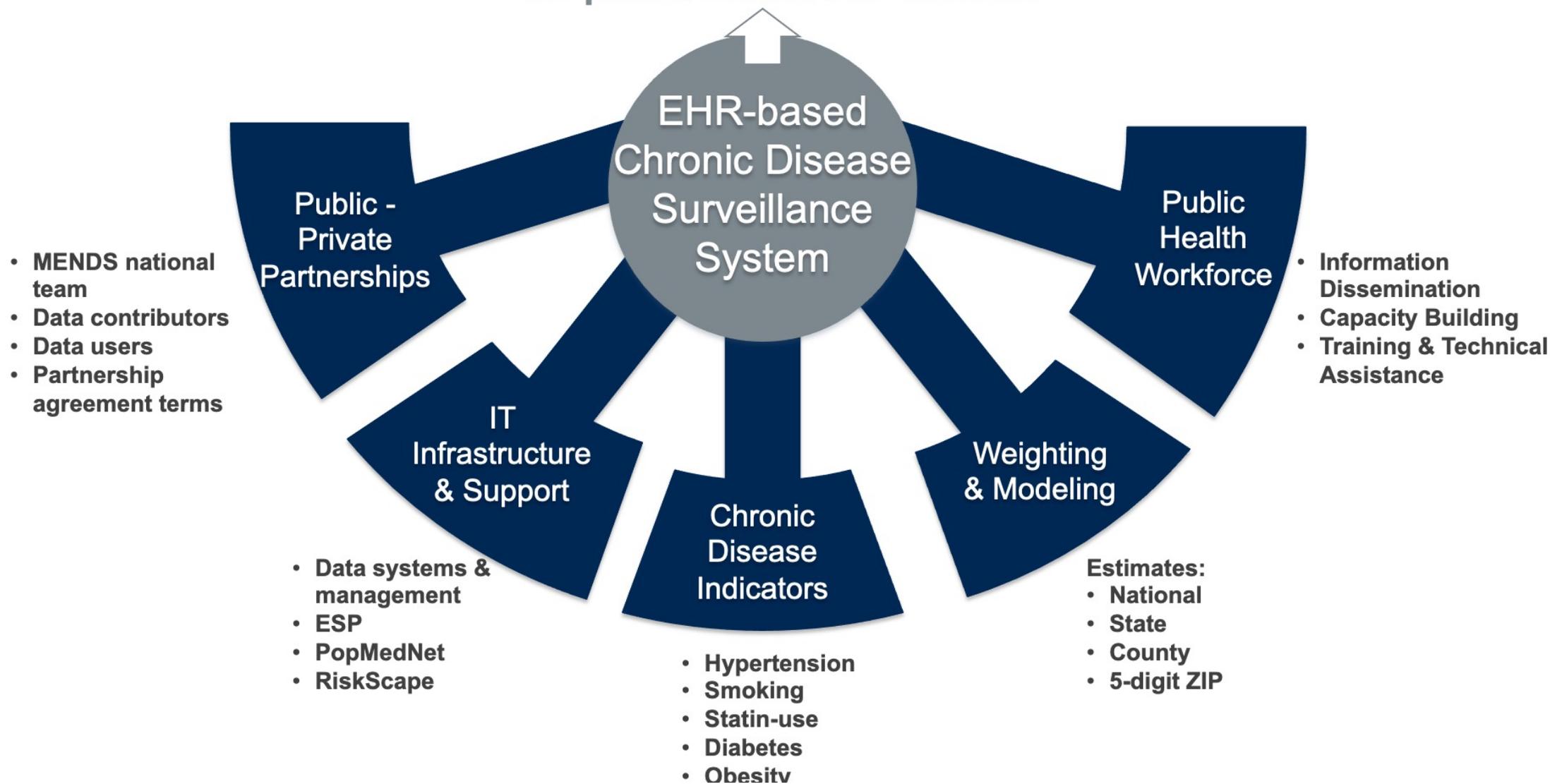
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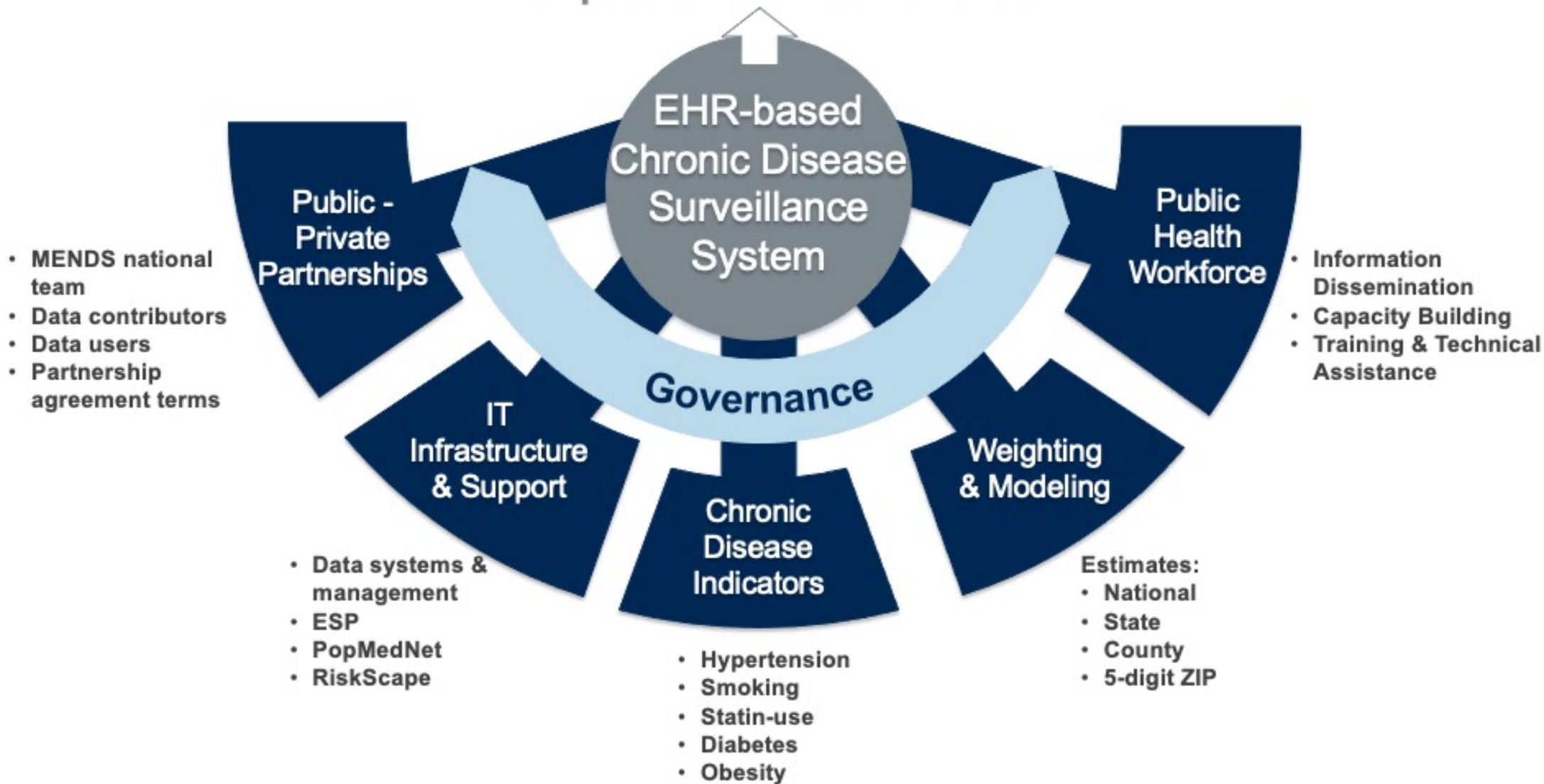
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Timely and reliable national and sub-national chronic disease estimates for public health surveillance



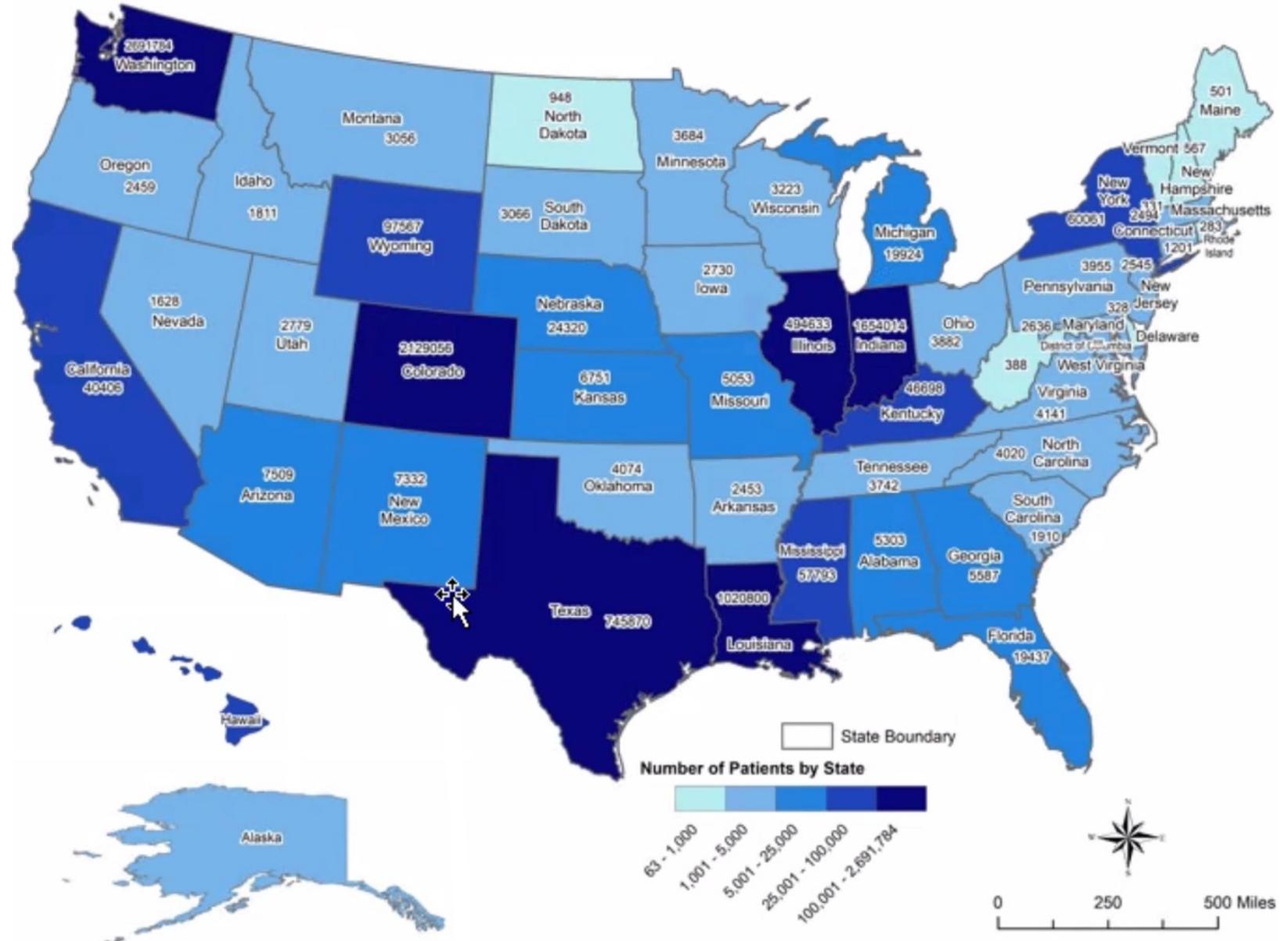
Key components

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Coverage map

Distribution of MENDS Patients by State



Future activities

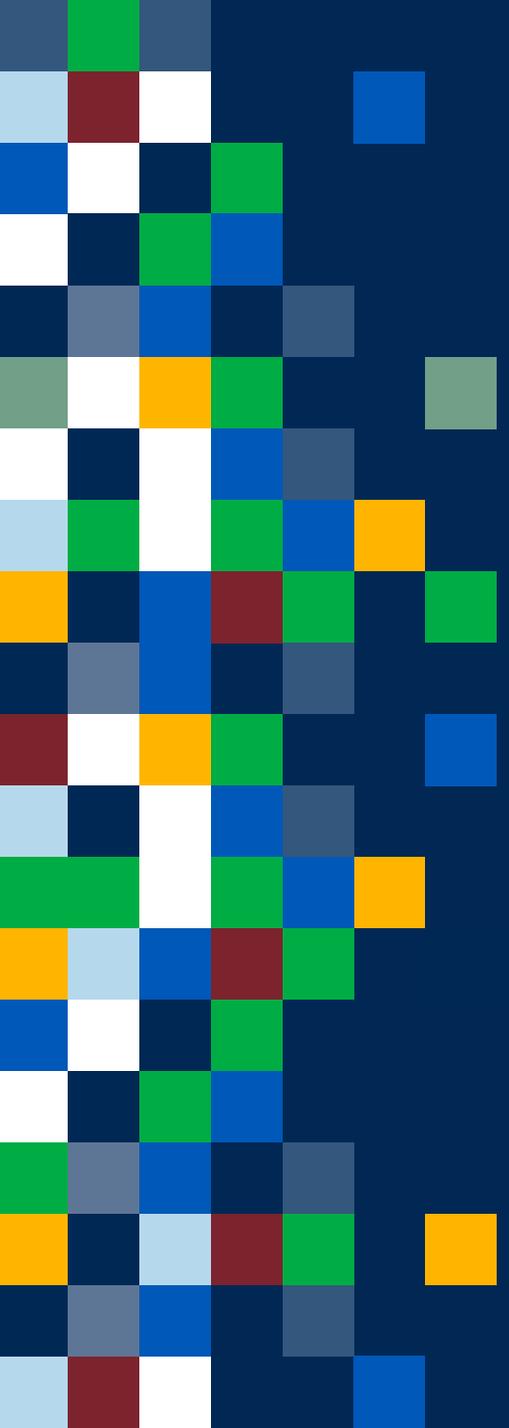
+ **Developing and implementing a new algorithm**

- Statin Therapy for the Prevention and Treatment of Cardiovascular Disease
- CMS eCQM 347
- Shift in approach to cholesterol surveillance

+ **MENDS is interested in moving toward the Fast Healthcare Interoperability Resources (FHIR) standard**

- Onboarding a new partner site in 2021 to test FHIR
- FHIR bulk data loader would serve the purpose of custom ETL script used today





Partner Site Spotlight: Washington



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System Concept & Vision

Washington MENDS implementation ~ technology and partnership

Department of Health involved since 2018 pilot project

- Braid existing state infrastructure with national effort to improve chronic disease surveillance
 - Leverage business infrastructure of health information exchange (HIE) provider, OneHealthPort
- Potential benefits accruing to public and private sector
 - DOH: Access to timely public health chronic disease surveillance data for policy and program design/evaluation
 - OHP: Hosts population-health analytic services platform that can be leveraged by public & private sectors

OneHealthPort business infrastructure

Building off established business model for data exchange

- OHP: for-profit Washington corporation & state's HIE Lead Organization
- Governed by Shareholders (local health care companies) & Board of Directors
- Contractual terms and policies governing HIE delegated to Common Trust framework
 - Participation in Common Trust framework documented thru HIE Participation Agreement
 - Entity then connects to HIE as a Trading Partner
- Common trust framework & agreements govern all information moving across the HIE
 - Info moving in/out of OHP-hosted Clinical Data Repository (CDR) & OHP support
- As public health hybrid entity, DOH uses modified HIE Participation Agreement and MOU for OHP HIE work

Overall data flow

Incoming raw CCDs

- CCD=Continuity of Care Document
- Currently Medicaid clients

Transform CCDs through Diameter

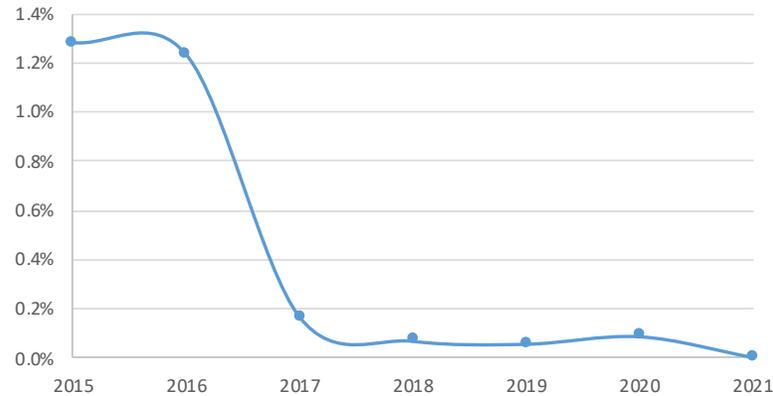
- Standardize and de-duplicate CCDs to improve data quality

Ingest clean CCDs into ESP

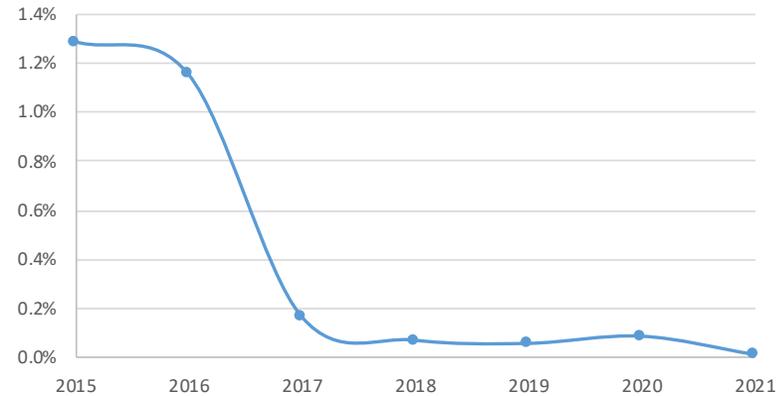
- Data for RiskScape and PopMedNet queries

Data quality – Vitals % excluded over time

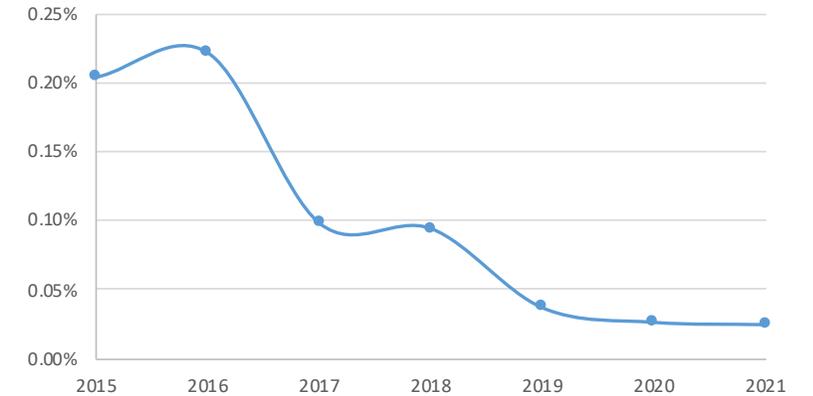
Systolic BP



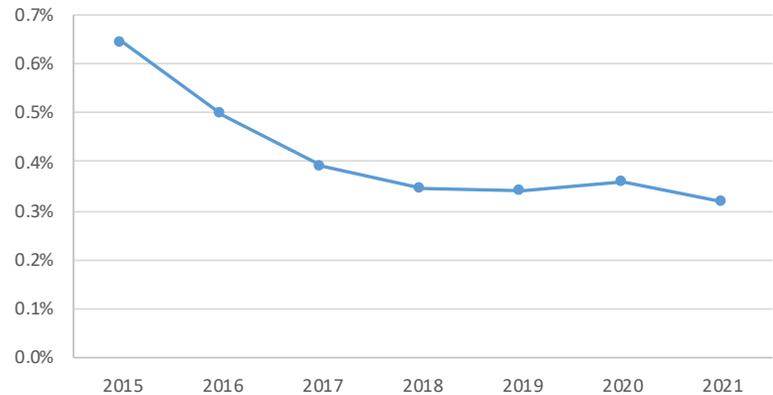
Diastolic BP



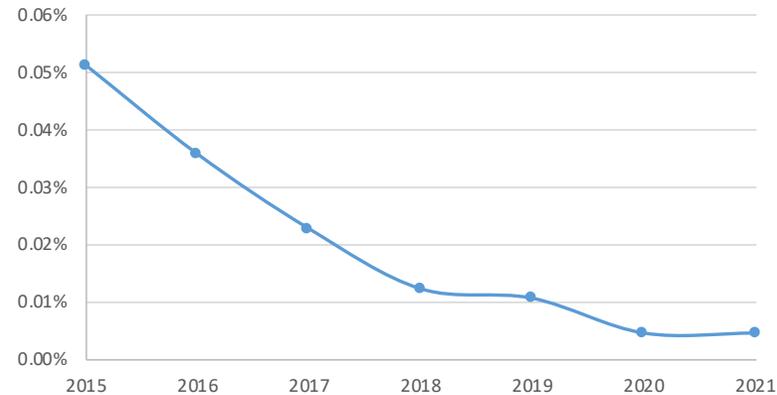
Temperature



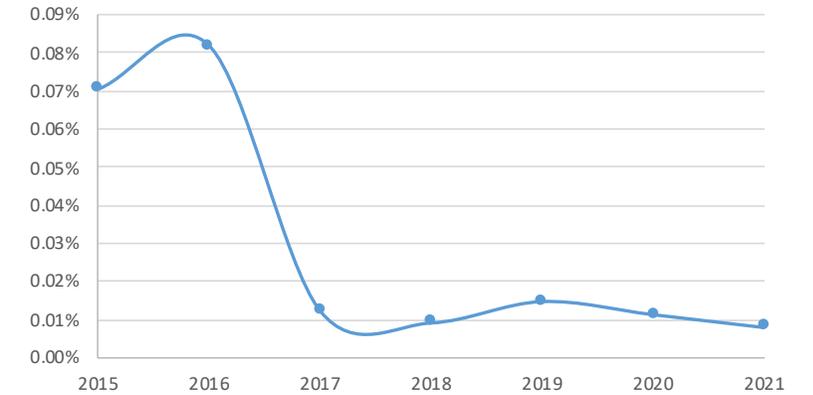
BMI



Weight



Height



RiskScape Visualization - Example

RiskScape

ESP Electronic medical record Support for Public Health

Data Last Updated Sept. 9, 2020
Population Under Surveillance: 184,119

Select Condition Definition or [Create your Own](#)

| Condition | Prevalence | Inclusion Criteria |
|------------------------|------------|---|
| TYPE 2 DIABETES | 8.74% | Age Group: ≥20 Recent Encounters: ≥1 in the past 2 years |
| SMOKING | 12.88% | Age Group: ≥20 Recent Encounters: ≥1 in the past 2 years |
| HYPERTENSION | 20.28% | Age Group: ≥20 Recent Encounters: ≥1 in the past 2 years |
| PEDIATRIC ASTHMA | 13.77% | Age Group: <20 Recent Encounters: ≥1 in the past 2 years |
| OBSESITY (BMI >30) | 11.22% | Age Group: ≥20 Recent Encounters: ≥1 in the past 2 years |
| OVERWEIGHT (BMI 25-30) | 11.86% | Age Group: ≥20 Recent Encounters: ≥1 in the past 2 years |

Prevalence reflects data from Washington State areas covered by ESP UAT data sources. The demographic distribution of the ESP UAT population can vary from total Washington State population. [See more.](#)

[RiskScape support or feedback](#)

RiskScape

ESP Electronic medical record Support for Public Health

Outcome(s) of Interest: Type 2 Diabetes

Inclusion Criteria: Age Group: ≥20 / Recent Encounters: ≥1 in the past 2 years

Overall Prevalence: 10284/117807 (8.7%)

Map showing geographic distribution of Type 2 Diabetes prevalence by county in Washington State. The map is color-coded by prevalence, with a legend on the right showing a scale from 2% to 22%.

Potential use cases

Consistent cross-jurisdictional chronic disease surveillance information
(Especially for sparsely populated areas)

Assess health disparities to direct resources & eliminate disparities
(CCDs have race and ethnicity info)

Extend cardiovascular preventive health services for high risk women in the *WISE-WOMAN* program

Support diabetes & hypertension prevention partnerships between healthcare system and community partners

Provider use case:
Balance analytic “have and have-nots”
(Especially urban v. rural hospitals)

Future vision

- Potential for national collaboration on chronic disease surveillance activities...
 - On-going assessment of existing case definitions (including maintenance like mapping for ICD version updates)
 - Algorithm development for emerging conditions of concern (e.g., fentanyl overdose, vaping lung injury, COVID-19 immunizations)
 - Inference model construction for public health surveillance information in areas with sparse or no data
- Shared platform for public *and* private sector tracking of chronic disease burden

Future directions

What do you think ...

- About the possibility of not owning surveillance data?
- About using EHR data in place of or to compliment existing data sources?
- About how well does EHR data capture inequities?
- About having solutions that are application vs. requirements based?
- About following national vs. local governance policies and procedures?



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